

Estimating the Reliability of Predicted Grades

University and Colleges Admission Service (UCAS)

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1. Introduction

Currently, offers of places in Higher Education Institutions in England are based in part on grades predicted by the student's subject teachers. The way in which these predictions are arrived at is unknown, but they are likely to be based on an estimate of how well the student has performed to date in various assessments and the teacher's knowledge of the likely academic potential of that student. However, the reliability of these predictions, and the way that admissions tutors use them in making offers, requires investigation in the context of widening access to Higher Education and fair admissions policies. In this report we examine both the overall reliability of grade prediction and the extent to which, and the ways in which, reliability is associated with factors such as a student's gender and ethnicity, the educational institution they attended and their socio-economic status. The rest of this report is organised into four sections:

- Section two briefly describes the data set and its characteristics;
- Section three presents the results of an analysis of the overall reliability of predicted grades and the factors that seem to affect this reliability;
- Section four discusses more detailed results of an analysis of the factors that may or may not affect the reliability with which actual grades are predicted; and
- The final section, Section 5, presents our conclusions.

2. Characteristics of the dataset

The data set consisted of a sample 36, 827 predicted and achieved subject grades. (Note: this is not the number of students as a student achieves grades in more than one subject for University entry.) The data includes qualifications from previous years, as set out in Table 1. This was due to some individuals having a mixture of achieved and pending qualifications.

Year	No. of cases
2004	35889
2003	829
2002	50
2001	25
2000	7
1998	5
1996	7
1995	2
1994	2
1992	2
1991	2
1978	3
1977	4
Total	36827

Table 1: Year of examination – data supplied by UCAS

The predicted grades consisted of letter grades, which were re-coded using the UCAS tariff to provide numerical scores for analysis, for example, 120 points for an A grade, 110 for an A/B prediction and so on. The achieved grades were re-coded in the same manner as the predicted grades. The data set includes students from Further Education (FE) and Arts Colleges, Grammar Schools, Independent Schools, Sixth Form Centres and Maintained Schools¹, sitting examinations set by five awarding bodies: AQA, Edexcel, CCEA, OCR, and WJEC. Other variables provided include a student's gender, ethnicity and socio-economic status² (SES), and the institution they were attending when they applied for HE entry via UCAS.

3. The overall reliability of grade prediction

To gain an understanding of the extent of under- or over-prediction of grades, the data was initially analysed by cross-tabulation to assess inter-rater reliability³ (Table 2). The vertical axis is the predicted grades and the horizontal axis is the actual grades achieved by the students. Examining the main diagonal of this table indicates that, on average, the reliability of the predicted grades is less than 50%, with the exception of A grades. However, the majority of the predicted grades were within plus or minus one grade of the actual exam result.

%	A	B	C	D	E	Ungraded
A	59.6	32	6.7	1.3	.4	.1
A/B	26.2	46.9	21.2	3.7	1.4	.6
B	9.1	39.4	36.6	11.6	2.5	.7
B/C	3.1	23.5	43.8	23.2	4.9	1.5
C	1.0	11.0	36.5	34.8	13.3	3.3
C/D	.4	5.1	24.1	42.8	22.4	5.2
D	.3	2.2	15.0	38.7	33.1	10.7
D/E	0.0	1.1	6.7	30.0	40.1	22.1
E	.3	1.1	5.7	21.3	41.9	29.6
E/UorN/E	0.0	0.0	0.0	25.0	75.0	0.0
U/E	-	-	-	-	-	-
N/U	0.0	0.0	0.0	0.0	0.0	100
Ungraded	0.0	0.0	0.0	20.0	40.0	40.0

Table 2: 2004 Prediction versus Achieved Percentages

¹ Originally FE Colleges and Art, Design and Performing Arts were separate; however for analysis these two were combined. Maintained Schools were labelled State Schools but was also changed during analysis.

² SES is broken into six categories according to student-reported parental occupation:

- SES1: Higher managerial and professional occupations;
- SES2: Lower managerial and professional occupations;
- SES3: Intermediate occupations;
- SES4: Small employers and own account workers;
- SES5: Lower supervisory and technical occupations; and
- SES6: Semi-routine occupations.

³ The problem was conceptualized as one of inter-rater reliability with the predicting teacher as one rater and the examination the other. A standard way of assessing inter-rater reliability is to calculate Cohen's Kappa which ranges in value from 0 to 1. Using a square table (i.e. eliminating the intermediate predicted grades) gives a Kappa value of 0.2. According to Landis and Koch (1977) this represent the lower point in the interval they describe as representing a "fair" degree of concordance.

In attempt to model the effects of different factors on the reliability of the predicted grades, a difference variable was constructed by subtracting the actual from the predicted grade. This variable allowed us to ascertain both the direction and the degree of accuracy of the predicted grades – the variable will have positive values when grades are over predicted and negative values when under predicted.

The proportion of subject grades that were over-predicted was substantially higher compared to those that were under-predicted (Table 3), and there were systematic effects of a range of factors on the reliability of the predicted grades⁴.

	Percent Under	Percent Correct	Percent Over
Total	8.7	44.7	46.7
Male	9.1	42.5	48.3
Female	8.3	46.5	45.3
SES1	7.5	51.4	41.1
SES2	8.6	46.3	45.1
SES3	8.9	43.0	48.1
SES4	8.5	40.9	50.5
SES5	8.8	40.4	50.8
SES6	10.2	39.4	50.5
White	8.5	45.4	46.1
Black	8.4	36.8	54.8
Asian	10.1	38.4	51.5
Chinese	7.6	45.5	46.9
Mixed	9.0	43.9	47.1
FE and Arts	9.5	37.1	53.4
Grammar	7.6	51.8	40.7
Independent	8.3	53.5	38.3
Sixth Form	10.0	43.5	46.5
Maintained	8.2	42.7	49.0
AQA	9.2	42.8	48
Edexcel	7.8	44.4	47.7
CCEA	7.3	57.7	35.0
OCR	8.2	44.9	46.9
WJEC	10.3	52.3	37.4

Table 3: The effects of a range of factors on grade prediction reliability⁵

Table 3 first reinforces the point made above that overall less than 50% of grades were accurately predicted. Predicted grades are significantly more reliable for females than males, and the grades for females are less over-predicted than for males; however the reasons for this cannot be ascertained from the data. The reliability of predicted grades is highest for students in SES1 and declines steadily to SES6. There are a number of

⁴ See Appendix 1.

⁵ This table includes data from all years.

possible reasons for this. First students with lower SES achieve lower grades and these are predicted less reliably than A grades. Second, a greater proportion of students from lower socio-economic backgrounds are learning in FE colleges and the reliability of prediction in these institutions is significantly lower than in the school sector, possibly because the college lecturers have known their A level students for only a year when UCAS applications are being produced. Similar reasons are likely to explain the lower reliability of grade prediction for Black and Asian students⁶. Teachers in Independent and Grammar schools make the most reliable predictions, largely because of the high proportion of A grades being achieved in these institutions. Finally there is an interesting pattern of variation in the reliability of the predicted grades between exam boards with reliability being significantly higher for the CCEA and the WJEC. We are unsure of the reasons for this, although in the case of the CCEA it is likely due to the use of this exam board by Grammar Schools in Northern Ireland. However, this is not the case for the WJEC, which is significantly more likely to be the board of choice in maintained schools and FE colleges (presumably largely in Wales).

4. Factors affecting predicted grades

This section examines the actual grades being achieved compared to the predicted grades by various factors such as ethnicity, gender and institutional type.

4.1 Ethnicity and Gender

The percentage of each grade predicted correctly for males and females is shown in Tables 4 and 5 respectively.

%	A	B	C	D	E	Ungraded
A	58.2	32.2	7.5	1.7	.4	.1
A/B	21.7	47.5	23.0	5.0	1.6	1.2
B	9.4	37.6	37.3	12.2	2.8	.6
B/C	2.8	23.5	40.7	25.4	5.7	2.0
C	.8	11.3	33.7	35.2	15.0	4.0
C/D	.2	5.1	20.7	44.6	23.2	6.2
D	.1	2.2	14.8	37.9	33.5	11.6
D/E	0.0	.9	3.5	23.5	45.2	27.0
E	.4	1.2	4.9	22.3	40.9	30.3
E/UorN/E	0.0	0.0	0.0	33.3	66.7	0.0
U/E	-	-	-	-	-	-
N/U	0.0	0.0	0.0	0.0	0.0	100
Ungraded	0.0	0.0	0.0	0.0	100	0.0

Table 4: 2004 predicted versus achieved grades for males⁷

%	A	B	C	D	E	Ungraded
A	60.7	31.8	6.0	1.0	.4	.1
A/B	29.0	46.5	20.0	3.0	1.2	.2
B	8.9	40.8	36.0	11.2	2.3	.8

⁶ We appreciate the dangers of collapsing the ethnic categories present in the 2000 Census into these very crude groupings presented here but it was the only way to make the analysis tractable.

⁷ 2004 data only

B/C	3.3	23.6	46.2	21.5	4.3	1.0
C	1.2	10.7	39.1	34.5	11.7	2.7
C/D	.6	5.1	27.1	41.2	21.6	4.3
D	.4	2.3	15.2	39.6	32.7	9.8
D/E	0.0	1.3	9.2	34.9	36.2	18.4
E	.3	1.0	6.8	20.0	43.1	28.8
E/UorN/E	0.0	0.0	0.0	0.0	100.0	0.0
U/E	-	-	-	-	-	-
N/U	0.0	0.0	0.0	0.0	0.0	0.0
Ungraded	0.0	0.0	0.0	33.3	0.0	66.7

Table 5: 2004 predicted versus achieved grades for females⁸

Overall, the reliability of predicted grades was higher for females and it appears that teachers are more able to accurately predict A and E grades. This could be due to the fact that there is less opportunity for variability (A grades cannot be over-predicted just as E grades cannot be under-predicted) and the larger ‘target’ represented by both the A and E grade compared to the narrow bands assigned to grades B-D.

Tables 6 and 7 and shows the reliability of predicted grades cross-tabulated by ethnicity and gender. It would seem that black and Asian male students have the most over predicted grades while Chinese males have the most reliably predicted grades although the proportion of correct predictions is still less than half.

	Percent Under	Percent Correct	Percent Over
White Male	8.9	43.0	48.1
Black Male	8.5	36.2	55.4
Asian Male	11.5	37.9	50.6
Chinese Male	7.9	45.7	46.4
Mixed Race Male	10.2	43.3	46.4

Table 6: Grade prediction reliability by gender and ethnicity – males

The data for females (Table 7) is not dissimilar. Black female students, followed closely by Asian female students, have the highest percentage of over-predicted grades. These two groups of students also have a significantly lower proportion of correct predictions than the three other groups.

	Percent Under	Percent Correct	Percent Over
White Female	8.2	47.4	44.5
Black Female	8.4	37.2	54.4
Asian Female	8.8	38.8	52.4
Chinese Female	7.2	45.3	47.5
Mixed Race Female	8.0	44.3	47.7

Table 7: Grade prediction reliability by gender and ethnicity – females

4.2 Socio-economic status, gender and ethnicity

⁸ 2004 data only

Table 8 shows that regardless of socio-economic status the reliability of prediction is highest for grade A.

	SES1	SES2	SES3	SES4	SES5	SES6
A	65.7	60.7	57.9	55.5	48.5	66.7
B	43.5	40.5	37.9	37.1	37.7	39.1
C	37.1	37.7	35.7	35.2	37.5	26.0
D	39.4	40.2	36.7	37.0	39.6	42.9
E	47.0	47.2	39.2	36.5	38.0	36.7
U	100	0.0	100	-	0.0	0.0

Table 8: Percent of correct predictions by actual grades and SES

However, further analysis of gender and ethnicity on socio-economic status for males and females (Tables 9 and 10 respectively) suggests a more complex picture.

Males	SES1				SES2		
	Under	Correct	Over		Under	Correct	Over
White (1388)	8.4	48.6	43.0	(4543)	8.6	44.2	47.2
Black (38)	5.3	26.3	68.4	(102)	7.8	34.3	57.8
Asian (95)	7.4	54.7	37.9	(373)	9.9	41.8	48.3
Chinese (17)	0.0	64.7	35.3	(41)	7.3	39.0	53.7
Mixed Race (53)	9.4	52.8	37.7	(130)	10.8	42.3	46.9

Males	SES3				SES4		
	Under	Correct	Over		Under	Correct	Over
White (1687)	9.38	40.4	50.3	(1158)	8.8	40.2	50.9
Black (56)	8.9	46.4	44.6	(21)	19.0	33.3	47.6
Asian (180)	14.4	30.0	55.6	(172)	12.2	34.9	52.9
Chinese (9)	11.1	66.7	22.2	(30)	6.7	43.3	50.0
Mixed Race (33)	6.1	33.3	60.6	(38)	13.2	31.6	55.3

Males	SES5				SES6		
	Under	Correct	Over		Under	Correct	Over
White (755)	7.9	37.1	55.0	(153)	9.8	44.4	45.8
Black (27)	7.4	29.6	63.0	(6)	0.0	16.7	83.3
Asian (132)	10.6	40.2	49.2	(47)	14.9	31.9	53.2
Chinese (13)	15.4	38.5	46.2	(1)	0.0	0.0	100.0
Mixed Race (12)	16.7	41.7	41.7	(3)	33.3	33.3	33.3

Table 9: Grade prediction accuracy by gender, ethnicity and socio-economic status – males

Females	SES1				SES2		
	Under	Correct	Over		Under	Correct	Over
White (1362)	6.5	54.8	38.7	(5475)	8.7	48.8	42.5
Black (34)	11.8	50.0	38.2	(166)	8.4	41.6	50.0
Asian (109)	7.3	52.3	40.4	(329)	9.1	37.7	53.2
Chinese (6)	16.7	66.7	16.7	(58)	10.3	43.1	46.6
Mixed Race (49)	6.1	44.9	49.0	(143)	6.3	49.7	44.1

Females	SES3		SES4
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	Under	Correct	Over		Under	Correct	Over
White (1974)	8.0	46.0	46.0	(1614)	7.6	43.1	49.3
Black(78)	11.5	28.2	60.3	(38)	10.5	28.8	60.5
Asian(182)	6.6	44.0	45.9	(214)	10.7	34.1	55.1
Chinese (20)	0.0	45.0	55.0	(21)	4.8	42.9	52.4
Mixed Race (58)	15.5	34.5	50.0	(22)	0.0	54.5	45.5

Females	SES5				SES6		
	Under	Correct	Over		Under	Correct	Over
White (946)	9.0	43.7	47.4	(149)	10.1	39.6	50.3
Black (48)	8.3	41.7	50.0	(0)	-	-	-
Asian (140)	8.6	42.1	49.3	(69)	8.7	39.1	52.2
Chinese (11)	9.1	36.4	54.5	(2)	0.0	50.0	50.0
Mixed Race (34)	5.9	38.2	55.9	(5)	20.0	20.0	60.0

Table 10: Grade prediction accuracy by gender, ethnicity and socio-economic status – females

On the whole, both male and female students have a greater chance of accurately predicted grades from SES1 than any other SES category probably because a larger percentage of these students attend Independent and Grammar schools where the teachers are more accurate in predicting grades (see section 4.3 below). White males have a higher percentage of over-prediction than correctly predicted grades in all six categories except SES1. Black males have the highest over-prediction of grades in each of the SES categories except SES3 and SES4 whereas for black females the opposite is true; the highest over-prediction is in SES3 and SES4. Grades for Asian and Mixed Race male students are over-predicted except for SES1 and this is the same situation for Asian and Mixed Race female students. Chinese male and female students have the highest rate of accurately predicted grades though the number of these students in the sample is small, so the statistics need to be read with care.

4.3 Educational institution attended

Of the five educational institutions, teachers from Independent schools, on the whole, are more accurate in predicting student grades across the range (Table 11). Grammar schools, Sixth Form Centres and Maintained School teachers are on a par with each other, although teachers at Grammar Schools are more likely to predict accurately A grades for their students (and are not very accurate at predicting E grades). Teachers from FE and Arts College were the least accurate in predicting their students' grades. As suggested earlier, the high rates of over prediction seen in FE and Arts Colleges (53.4%) could be explained by the type of students being taught in these institutions, and the fact that the teachers in these institutions have known their students for a lot less time than the teachers in the other educational institutions. However we do not have the data to accurately assess the validity of this statement.

	FE	Grammar	Independent	Sixth Form	Maintained
A	54.5	66.6	65.3	56.4	56.0
B	31.6	41.1	45.5	39.1	39.2
C	32.0	38.0	40.2	38.1	36.3
D	39.7	41.9	43.5	39.4	37.7
E	29.9	36.0	46.0	42.3	44.7
U	-	0.0	100	50.0	-

Table 11: Percent of correct predictions per school type

4.4 Examination boards

The number of subject grades per examination board and the number of each type of educational institution which uses each examination board are shown in Tables 12 and Table 13 respectively.

Examination board	No. of subject grades	%
AQA	16009	43.5
Edexcel	8615	23.4
CCEA	1003	2.7
OCR	9227	25.1
WJEC	1973	5.4

Table 12: No. of subject grades per examination board

Examination board	FE and Arts College	Grammar Schools	Independent Schools	Sixth Form Centres	Maintained Schools
AQA	2299	968	1658	3289	7600
Edexcel	935	667	1533	1333	3821
CCEA	59	812	-	17	115
OCR	1087	576	1525	2007	3835
WJEC	414	30	76	283	1150

Table 13: No. of subject grades per type of educational institution per examination board

There is considerable variation in the reliability with which different grades are predicted across the five examination boards (Table 14). The reasons for this are unknown.

	AQA	Edexcel	CCEA	OCR	WJEC
A	58.2	59.8	75.3	57.4	63.1
B	37.8	37.6	46.2	41.4	46.2
C	36.4	34.5	32.9	36.6	46.5
D	37.8	37.6	40.6	40.0	49.5
E	42.0	43.5	33.3	41.3	38.2
U	50.0	0.0	-	-	-

Table 14: Percent of correct predictions per examination board⁹

⁹ 2004 data only

5. Conclusions

Overall the reliability of the predicted grades is low if one is expecting absolute accuracy, but reasonable if one considers the proportion of predictions that fall within plus or minus one grade of the actual examination result. Prediction is most reliable at either end of the range of grades, especially so for the A grade. Other general conclusions include:

- Female students have more accurate predictions made on their subject grades;
- Teachers at Independent schools, on average, are more likely to make accurate predictions;
- Teachers using different examination boards vary in the reliability of their predictions.

Of all the variables (gender, ethnicity, socio-economic status, educational institution and examination boards) ethnicity seems to be the factor that has the most influence on the prediction of grades. The data shows black male and female students' grades are the least accurately predicted followed closely by Asian male and female students. These four groups also have the highest proportion of over-predicted grades.

However, drawing any conclusions about what factors might affect the reliability of prediction is complicated by the high degree of interaction between the factors. For example there is clearly an association between the reliability of grade prediction and socio-economic status, ethnicity and institution attended. However these variables interact so that it is not possible to say that examples of good 'grade predicting practice' are to be found in Independent or Grammar schools as teachers in these institutions seem to have an inherently easier task in predicting grades, primarily because they have a less variable range of possible attainment to deal with and their on average smaller size means that teachers may know the students they are teaching better.

Part 2: The impact of over and under prediction of A level grades on offer making

For the second part of this report we were asked to investigate the extent to which over prediction of a student's A level grades at the time of their application to Higher Education, might result in a systematic advantage in terms of their gaining access to Higher Education. We interpret advantage as meaning a student who was given an offer based on their predicted grades, who subsequently did not achieve their predicted level of exam attainment but was nonetheless still offered a place at the HEI that made the original offer, i.e. achieved access with lower grades than originally required. Such a student could be considered to have incurred an advantage to the extent that there might be other students in the population of applicants who achieved the grades required for a course but who were not considered by the Higher Education institution concerned through, for example, the clearing process. From the perspective of a Higher Education institution it might be considered sensible to offer a place to a student who has just missed the offer, because that student has shown commitment to the institution, and accepting the student at this stage reduces the search costs incurred by taking students via clearing.

To assess the evidence for such systematic advantaging of students with an inflated prediction of their A level grades, UCAS provided us with an additional data set containing information for each candidate on:

- Whether they were accepted by an HEI
- The HEI type they were accepted by
- The course type they were accepted on to
- The number of HEIs they applied to
- The type of HEIs they received offers from
- The number of HEIs they received offers from

This data set was merged with the previously supplied data on a candidate by candidate basis. This produced a data set containing 12, 299 cases where each case represents an individual applicant. We calculated the overall predicted UCAS Tariff points score, the achieved UCAS Tariff points score and the difference between the predicted and achieved scores for each candidate (Figure 1). Candidates were then classified as having their exam grades over, under or exactly predicted on the basis of the sign of this 'difference' variable.

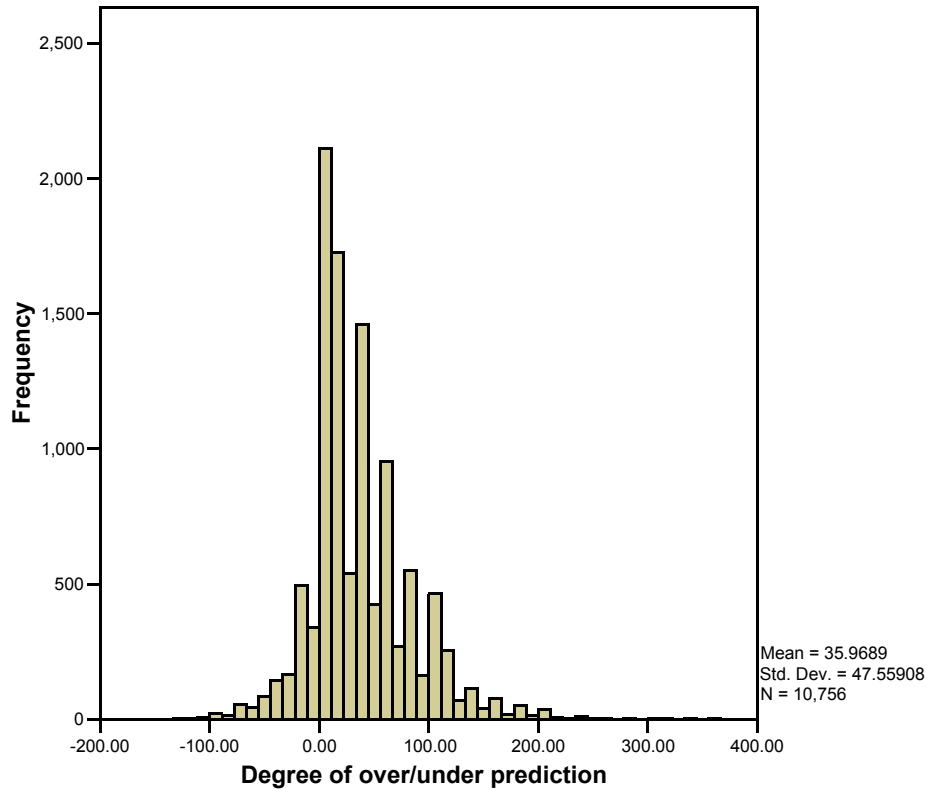


Figure 1 The extent of over and under prediction of candidates' A level scores. 0 = exact prediction, negative scores indicate under prediction, positive scores indicate over prediction.

Results

A simple cross tabulation of whether or not a candidate was accepted by an HEI and whether their grades were over, under or exactly predicted produced no significant effect ($\chi^2 = 1.05$, 2 d.f., $p = 0.59$). A more sensitive analysis, employing a binary logistic regression model, indicates a significant decrease in the odds of being accepted as the degree of over prediction increases. However, as Table 15 indicates, the effect is small:

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Difference	-.002	.001	13.728	1	.000	.998
	Constant	1.929	.036	2863.900	1	.000	6.884

a Variable(s) entered on step 1: Difference.

Table 15 The binary logistic regression model fitted for the relationship between acceptance/non-acceptance by an HEI and the degree of over and under prediction of A level exam grades (Difference) – see Figure 1.

Extending this model to include a range of demographic variables such as gender, socio-economic status and type of institution indicates that compared to young people from Maintained schools (the reference category) those from Art and FE colleges had significantly lower odds of being accepted by an HEI, whilst the odds of being accepted were significantly higher for those from Independent Schools compared to those applying from Maintained Schools. However, this is primarily the result of students from Independent Schools achieving Higher A level grades compared to students from other types of institution.

On the basis of this analysis we conclude that there is only weak and negative evidence of a systematic relationship between an individual's chances of being accepted at an HEI and their examination grades being over predicted at the time of application to Higher Education. Furthermore, there is no evidence to support the view that those with over predicted grades received more offers than those who have their performance under predicted. However, we do not know the actual offer made to an applicant by the institution that eventually accepted them, and this information is crucial to develop this analysis further. Consequently, we have asked UCAS to assess the possibility of providing us with this information.

Appendix 1: Outcomes of Univariate ANOVA

The effect of a range of factors on the degree of over and under prediction was assessed using Analysis of Variance. The factors found to have a significant impact in a simple main effects model are shown in Table A1.

Dependent Variable: Difference

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	152724.823(a)	15	10181.655	27.748	.000
Intercept	593313.021	1	593313.021	1616.968	.000
SES	17099.615	5	3419.923	9.320	.000
Gender	15130.815	1	15130.815	41.236	.000
Centre	76061.338	5	15212.268	41.458	.000
Board	39056.861	4	9764.215	26.611	.000
Error	9234879.688	25168	366.929		
Total	12408000.000	25184			
Corrected Total	9387604.511	25183			

a R Squared = .016 (Adjusted R Squared = .016)

Table A1 A simple main effects model showing the significant impact of 4 factors on the degree of over/under prediction of A level results.

However, as table A2 indicates, there are strong interaction effects between these variables.

Tests of Between-Subjects Effects

Dependent Variable: Difference

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	294603.316(a)	311	947.278	2.591	.000
Intercept	136891.978	1	136891.978	374.439	.000
SES	6634.312	5	1326.862	3.629	.003
gender	671.935	1	671.935	1.838	.175
centre	11953.135	5	2390.627	6.539	.000
board	4183.321	4	1045.830	2.861	.022
SES * gender	952.143	5	190.429	.521	.761
SES * centre	19990.531	25	799.621	2.187	.001
gender * centre	622.828	5	124.566	.341	.888
SES * gender * centre	7597.492	25	303.900	.831	.705
SES * board	8215.826	20	410.791	1.124	.316
gender * board	647.096	4	161.774	.442	.778
SES * gender * board	3643.918	20	182.196	.498	.969

centre * board	14001.286	19	736.910	2.016	.005
SES * centre * board	35975.180	82	438.722	1.200	.105
gender * centre * board	7758.824	18	431.046	1.179	.268
SES * gender * centre * board	23515.461	72	326.604	.893	.728
Error	9093001.195	24872	365.592		
Total	12408000.000	25184			
Corrected Total	9387604.511	25183			

a R Squared = .031 (Adjusted R Squared = .019)

Table A2 A full factorial model showing the significant impact of 4 factors and their interaction on the degree of over/under prediction of A level results.

Examination of post-hoc comparison statistics indicates that that it is young people from lower socio-economic groups in FE and Art Colleges, with the lowest levels of overall attainment, who have the greatest level of over prediction of their grades.